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ABSTRACT

Due to the excitement and enthusiasm shown by teachers, students, and community members participating in a summer school program, the Novato Unified School District, California, has compiled this sourcebook to guide others in developing a similar program. In 1969 and 1970 the school district established a multi-graded conservation education summer school program for a six-week period, involving seven teachers and 180 students in grades four through eleven. One of its outstanding features was the use of local environmental studies and community action projects which supplied both relevance to the program and continuing ideas and projects for the following school year. Within the guide, information is recorded on: (1) how to get a program started, (2) preplanning procedures, (3) publicizing the program, (4) examples of the daily program, (5) projects and activities, and (6) evaluation procedures. Appended material includes sources for information and materials, supply lists, and a student-developed consumer handbook. (BL)

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ED 067234

A MULTI-GRADED CONSERVATION EDUCATION

SUMMER SCHOOL MODEL

BY

THE SUMMER SCHOOL STAFF 1970
NOVATO UNIFIED SCHOOL DISTRICT
NOVATO, CALIFORNIA

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SE 014 442

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This guide was written by the staff of the 1970 summer school conservation program of the Novato Unified School District, Novato, California.

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The staff wishes to express its appreciation to the District science curriculum coordinator Mr. Richard Melendy for his untiring efforts to initiate this pioneering program and act as our chief consultant throughout its development.

FOREWORD

In 1969 and 1970, the Novato Unified School District, located just 20 miles north of San Francisco, in Marin County, established a multi-graded conservation education summer school program.

It was a six week program involving 180 students and seven teachers. They met for four hours each day and 20 different schools were represented in the 4th through 11th grades.

The entire cost of the program was through state A.D.A. funding.

The excitement and enthusiasm of the teachers and students participating in the program were nothing short of phenomenal. The entire community became involved and many projects that were started during the summer have continued to benefit the quality of our local environment.

The staff feels that your community would benefit tremendously by the development of a similar program. With this in mind, they offer this guide in hopes that you will offer a conservation program in your district.

THE PHILOSOPHY

1. Awareness of the earth's environmental problems is crucial to our survival. There is a need for the instruction of conservation education at all levels. It is important that the facts be gathered, that decisions be made and each individual do his part to help improve the quality of our environment.

2. Elementary and secondary students (4th - 11th grades) can work and learn together in a non-graded summer school conservation program. The common objective of discovering the problems concerning our environment and attempting to work out solutions, is a unifying and underlying force which will make the program successful.

3. An emphasis on action type activities such as field trips, laboratory investigations, community projects and the use of guest lecturers with opposing views creates a maximum learning situation.

4. Students and teachers involved in the program will institute spin-off conservation clubs and programs when they return to their own schools in the fall.

5. The general community will become involved and many positive steps will be taken by concerned citizens to improve local environmental conditions.

SPECIFIC OBJECTIVES

1. To study in depth the following environmental problems:

   a) Population problems

   b) Air pollution

   c) Water pollution

   d) Soil conservation

   e) Wildlife conservation

   f) Transportation

   g) Solid waste disposal

   h) Power conservation

   i) Noise pollution

   j) Visual pollution

2. To stress the simple and complex interrelationships between man and his community.

3. To make maximum use of local, regional and state agencies, both governmental and private, to provide lecturers, demonstrations, films and current information as to the nature of specific ecological problems.

4. To provide a laboratory situation in which experiments and research by students can be conducted.

5. To involve the community through development of a recycling program for aluminum, glass, tin, bi-metals and newspaper.

6. To give each student the opportunity to make a personal commitment toward improving the environment based on factual evidence gathered during the summer experience.

UNIQUE ASPECTS OF THE SUMMER PROGRAM

1. It was funded entirely by standard A.D.A. financing.

2. It was multigraded to include 4th - 11th graders.
3. A staff of seven teachers was self-selecting and perpetuating.
4. Flexible programming allowed subgrouping according to interests and abilities.
5. Local environmental studies gave instant meaning and importance to program.
6. Outside speakers were often paired with opposing points of view to give student both sides of an issue.
7. Action projects which involved the community were undertaken.
8. Enrollment was limited to 180 students but over 200 signed up. A waiting list was maintained and as a result enrollment maintained itself throughout the summer.
9. There was maximum use made of every available teaching aid.
10. Spin off program ideas and projects continued into the regular school year. Elementary and secondary schools set up ecology clubs and other teachers are learning from students who were involved in the program. The scouts, 4-H clubs, church groups, garden clubs and other civic groups are now actively supporting conservation activities within the community.
11. A consumer's guide toward improving environmental quality was published and distributed. (See appendix page 63).

HOW TO GET THE PROGRAM STARTED

SELECTING THE STAFF

The initial problem is to find several teachers who could work very well together in a team teaching situation. They should be obviously interested in the conservation and ecological problems facing the world today. Here are 3 suggestions as to how to identify prospective staff members:

1. Find the teacher who has developed a unit or section on ecology for classroom use that was well received by the students.
2. Find the teacher who has consistently shown an effort to develop new material and techniques in teaching his own subject area.
3. Find the teacher who is willing to work extra hours in developing a summer school conservation program.

In addition to the above, several other factors involving the composition of the staff should be considered:

1. At least four of the staff members should have a strong science background.
2. At least two of the staff members should be elementary school teachers so as to relate more closely to the fourth-sixth graders.
3. At least one member of the staff should be a social science teacher in order to strengthen the socio-political aspects of the program.

If some of the first summer's staff desire to return to continue the program for a second year, they could form a nucleus that could aid in the selection of new teachers. In this way a smooth functioning staff could be guaranteed and the team teaching approach utilized to its maximum with a minimum of petty problems.

Once the program has experienced one successful year the applications from other teachers within the district will increase and the problem of staff selec-

tion will indeed be a difficult task. It is suggested that a formal application form designed specifically for the conservation summer school teaching position be used. Questions concerning the applicant's background in the field of conservation could offer additional help in finding well qualified personnel.

THE ADMINISTRATIVE ROLE

The curriculum coordinator of the district should call the initial meeting of the proposed staff after sounding out each teacher individually for his interest in the project.

At the first meeting, some of the items on the agenda should include the following:

1. Make known the length of the program in weeks, days and hours per day.
2. Make known the salary for the certificated personnel.
3. Give notification of any substitute time that is available to the group for planning purposes. A minimum of three days is recommended. The time when these days would be used would be determined by the staff.
4. Hire a non-certificated secretary for the summer and make arrangements for typing requirements before opening day to be handled by a school or administrative secretary.
5. A decision should be made as to which school facility to use for the conservation program. It is preferable to use a school site that is not being occupied by the regular summer school program. The school should definitely have at least one room in which 200 people could be seated for large group presentations. Laboratory

facilities should be made available.

6. Discuss the use of such volunteer help as parents, college students and other people to augment the staff. An effort should be made to reduce the teacher-pupil ratio to 1-12.
7. A commitment by the administration to give maximum assistance and support to the program in all ways possible should be made.
8. The appointment of a director and a secretary from within the staff should be made.

ROLE OF DIRECTOR

The director provides liaison with the district administration and co-ordinates all the pre-planning sessions. The director's responsibility could continue during the program or the staff may desire to set up some form of rotational directorship in which a different member is responsible for administrative decisions each week. There should be an additional sum of money agreed upon for this assignment.

ROLE OF SECRETARY

The secretary should take notes of the planning sessions and insure that the minutes are distributed to all group members and the District office. The secretary should keep all correspondence copies and other important documents in a notebook for future reference.

9. If the school district has a standard procedure for initiating a new course, then the procedure should be followed with the group formulating the course and submitting it as soon as possible.
10. The date for the next meeting should be set. Discuss the value of using the first substitute teacher day.

PREPLANNING SESSIONS

There are myriad details to be worked out before the summer program actually begins. The brainstorming session that will now take place will be as productive as any the teachers have ever experienced. The sessions should begin in March or early April at the latest. Planning sessions can be scheduled after school or on Saturdays in addition to the substitute teaching time.

Members of the staff should be willing to take on as much responsibility as necessary in sharing the load of the preliminary work.

The first day of substitute time should be used to accomplish the following:

1. Write the general philosophy of the program.
2. Discuss additional teacher aides and contact the most likely candidates.
3. Tape a long piece of butcher paper to one wall and block in the six week calendar.
4. Select specific topics to be studied and decide on the approximate length of time the staff wish to spend on each.
5. For each topic to be covered make a list of appropriate:
   a) Speakers
   b) Demonstrations
   c) Field trips
   d) Laboratory exercises and activities
   e) Films and other AV material
   f) Books, pamphlets and charts available.
6. Make tentative decisions and assign or assume responsibility to contact speakers, order films, check field trip possibilities and construct lists of activities.

PREPLANNING SESSIONS (continued)

7. Ask the director to contact the District library facilities for books that can be made available for the summer program.
8. Decide on the next meeting date.

This first session should end with each teacher having some responsibility that can be accomplished before the next agreed upon meeting date. The secretary should outline what transpired and insure that copies are distributed to each staff member as well as to the district curriculum coordinator.

THE SECOND PREPLANNING SESSION

The second staff meeting should begin to show confirmations of guest lecturers, films, activities and field trips. The staff should also consider the following suggestions:

1. Design a flyer announcing the program to be sent to all schools.
2. Decide who will visit which schools to promote and encourage registration for the conservation program. Set the dates for these visitations and try to complete them within a week. Perhaps a second substitute teaching day could be used for this promotional activity.
3. Write a newspaper release and get approval for it from the District office. The object is to alert the general public to a valuable program that is about to be offered to students within the District.
4. Each staff member should now assume responsibility for the detailed programming of a specific topic or a week. All information, books, ideas, activity ideas and field trip planning are then channeled to that person. Of course, the entire group then reviews the detailed daily program and, after any revisions are made, the outline is written in on the master calendar.

THE SECOND PREPLANNING SESSION (Continued)

5. A central collection point should be established for incoming mail, films, pamphlets, supplies and other items relating to the summer conservation program. Arrange to have the school that will be used during the summer to receive the material. It will insure some continuity to the overall organization.
6. Type up a master supply list requisition and submit through proper channels for approval. (See appendix page 61).
7. Prepare a bus request for field trips and submit it through proper channels for approval.
8. Brainstorm specific activities that relate directly to each topic being covered and write them on the master calendar.
9. Set date for the next meeting making sure each individual staff member has a clear idea as to which things he or she is responsible for completing.

THE THIRD PREPLANNING SESSION

By the third meeting the program should be blocked in and the group effort should focus now on such specific details as daily activities, timing of field trips, and the determination of the student enrollment. Other concerns that should be taken care of might include:

1. Ditto or mimeograph a master calendar on an 8 1/2" x 11" sheet of paper for distribution to the students on opening day.
2. Ditto a blanket field trip permission slip that can be taken home by the students on the first day. (See next page for example).
3. Design the card that will be sent home to the students accepted and one for those being placed on a waiting list.
4. Decide if any follow-up publicity is needed in order to balance out the distribution for a specific grade level.

FIELD TRIP PERMISSION SLIP June 22, 1970

My son/daughter _____ has my permission to
(name)
participate in all scheduled field trips in the Summer School Conservation Education program as listed below:

_____
Parent or Guardian's Signature

San Marin High School
Conservation Education

JUNE 30 - TUESDAY	Mr. Read Mrs. Correa	to	Ford Motor Co. Assembly Plant Milpitas, Calif.
Bus 1	Bus will leave San Marin High School at 8 a.m. Bus will return to San Marin High School at about 1:50 p.m.		
Bus 2	Mr. Dawson Miss Hunt	to	Stafford Lake
	Mr. Behrens Mrs. Todd Mr. Vestel	to	Sanitary Disposal Plant
	Bus will leave at 8:30 a.m. Bus will return at 12:00 p.m.		
JULY 2 - FRIDAY	Mrs. Todd 1/2 Mr. Vestal's group Mr. Behrens	to	Ford Motor Co. Assembly Plant
Bus 1	Bus will leave at 8:00 a.m. Bus will return at about 1:30 p.m. (Schedule as June 30)		
Bus 2	Mr. Read Mrs. Correa	to	Sewage Plant
JULY 7 - TUESDAY	Remaining students and 1/2 Mr. Vestal's group	to	Ford Motor Co. Assembly Plant
JULY 9 - THURSDAY	*Groups to be announced		
Bus 1	To San Francisco, Standard Oil Building		
Bus 2	To Richmond, Standard Oil Refinery Tour		

JULY 13 - MONDAY 3 Buses to the Petaluma River Survey of Plants & Animal Life.
JULY 15 - WEDNESDAY 3 Buses to Hamilton Air Force Base.
JULY 17 - FRIDAY 3 Buses to Audubon Canyon Ranch.
JULY 22 - WEDNESDAY 1 Bus to Vacaville Game Preserve.
JULY 24 - FRIDAY 3 Buses to James Grossi Ranch, Novato Blvd.
JULY 28 - TUESDAY 1 Bus to Vacaville Game Preserve.
JULY 29 - WEDNESDAY 3 Buses to Alameda Memorial Beach Park.
JULY 31 - FRIDAY 3 Buses to Lion's Park.

MASTER CALE ER

NUSD SUMMER SCHOOL CONSERVATION CLASS 1970

Week #1 People Problems
2 Transportation and Waste
3 Air Conservation

Week #4 Water Conservation
5 Power Conservation
6 Wildlife

* Field trips

22 June Orientation Scavenger Hunt Richard Harriman "Problems with People" Film "The Squeeze"	23 Construct a closed Ecosystem Ecotactics Seminar Films: The Lemmings No deposit-no return	24 Ecology questionnaire lecture "Throw Away World" Red Cross gives a damm Small Groups Go!! Film: Boomsville Pandora's Pop Top	25 Complete Ecosystem Philo Farnsworth "Homes of the Future" Small Groups Go!! Individual and group activities	26 Roy Schubert Zero Population Small Groups Go!! Film: Food or Famine
29 Transportation Problems Today and Tomorrow GG Bridge, NASA, Air Trans. Assoc., So. Pacific	30 Ford Motor Co. * Assembly Plant * Sanitary Disposal Plant * Water Plant (Stafford Lake)	July 1 John Briggs - TV - slides Peter Behr - Cars of Future Film: 3rd Pollution	2 *Ford Motor Co. *Sanitary Disposal Plant Small Groups Go!!	3 H O L I D A Y
6 Bay Area Air Pol. Control Dist. Reports Paul Brand Film: Pollution (Tom Lehr) To Clear the Air	7 Kaiser Industries Slide-Film "Recycling" * Ford Motor Co.	8 Fuels-Lecture-Demo. Earl Behrens General Motors - "Air Pollution & Mass Trans." Film: Air Pollution	9 Standard Oil Co. * Refinery Tour Standard Oil Bldg., S.F.	10 Mr. Lunsford State Dept. of Water Resources Film: Sounding on Future of S.F.Bay
13 Petaluma River * Survey Plants & Animals Film: River Must Live	14 Lab Work-Coliform & Bacterial tests River samples Bill Melson-NMWD Film: Prob. with H_2O is People	15 * Tour of Bart (1/2) Lab tests Recycling Projects Small Groups Go!!	16 Small Group Evaluations Newspaper published Small Groups Go!!	17 * Al Solnit Bolinas Bay Report and Tour
20 Power Problems Bell Telephone Rep. Gill Culver Atomic Energy Film: Glen Canyon two Yosemite	21 * Small Groups Go!! 1/2 to Bart Social Action Groups	22 * Vacaville Game Preserve Slide Show of Summer	23 Power Panel P.G.& E., A.E.C. Sierra Club Consumer Booklet Handed out	24 * James Grossi Ranch "Mod" Farm
27 Game Management Speaker: Mr. Rawlins Film: Living Soil Rival World	28 * Vacaville Game Reserve Recycling Groups	29 * Lecture-Tour Alemeda Memorial Beach Park	30 Dr. Zumwalt Audubon Canyon Ranch Film: A Matter of Time	31 * Private Recreation Facility San Marin Club

HOW TO OBTAIN A GUEST SPEAKER

Any one can call up someone on the phone and ask for a speaker but here are a few ideas that might help in achieving this goal more easily. The object is, of course, to get the best possible speaker without cost. In some instances, however, a well known speaker may have a fee for his services and the staff should be able to budget some additional money for this contingency if necessary. Some steps you might want to consider should include the following:

1. Decide on the specific topic to be disucssed by the speaker.
2. Call or go to the most logical source for accurate information.
3. Explain to the prospective speaker nature of the summer school program and give a few highlights that make it sound exciting and important.
4. Ask for the most knowledgeable person available to be a guest lecturer. Give a preferred date.
5. Be sure and see if the person can bring with him additional materials like pamphlets, slides, films and demonstrations that might add to his presentation.
6. Be sure to mention other well known people and companies who are donating their time and materials to the program.
7. If possible, arrange to have an additional speaker with an opposing point of view. Be sure to let both individuals know that the other is planning a good presentation. This will insure an excellent and well prepared program from both.
8. Don't hesitate to set up a panel discussion with several guests. This can be moderated by one of the staff members and it makes an exciting presentation.

HOW TO OBTAIN A GUEST SPEAKER (Continued)

9. If your contacted speaker has agreed for a specific day and time, then be sure to follow-up with a letter of confirmation as soon as possible.
10. After his presentation be sure and follow-up with a thank you note for his participation in the program.

PUBLICIZING THE PROGRAM

Once the staff members have been selected and given the go-ahead, it is important that they begin as soon as possible on the publicity.

There are many ways in which a pioneering program such as this can be publicized.

1. The district Publication office should prepare a news release for the local press.
2. A flyer should be designed and distributed to each school to be sent home with the students.
3. A special section announcing the program can be inserted into the usual summer school bulletin sent home with students.
4. Representatives from the summer school conservation staff should make personal visits to each school to speak to the students.

The fourth method is the most effective and provides the staff some measure of control over the numbers of enrollees from each grade level. The program is very easily over-sold to the elementary school children and you do not want the summer school student population skewed too much on the lower end.

To increase the sign-ups on the secondary level the department chairmen should be contacted and their help enlisted in selling the program.

At the time of school visitations, an application can be distributed to interested students.

SELECTING ENROLLEES

In designing the application forms, make sure the name, grade level and date are easily seen at the top of the form when returned by the students. The applications will usually number more than the total enrollment desired and the staff should agree on some procedure for picking those whom they wish in the program. There seems to be no easy way and it is a somewhat frustrating task. Some suggestions that might be of help include:

1. Try to balance the grade level representation. Don't overload with 4th and 5th graders.
2. Try to maintain a boy-girl balance.
3. Try to include representative students from each school feeding into the program.
4. Try to follow a "first-come, first served" basis as closely as possible. This will not work completely because blocks of applications coming in from one school could easily total 150 or more.

Having somehow arrived at the optimum number desired, notices should be sent out to each student accepted into the program. The notice could be a postcard stating the opening date, classroom assignment and any other necessary information concerning the program.

The remaining students should also be sent notification that they are being placed on a waiting list from which additional students will be called as drop-outs or cancellations occur. This gives the parents an option of enrolling their child in some other course for the summer.

The selected students should then be divided into home-room groups with each grade level being represented in each class. The home-room group will act as the starting position for each day's activities. It is very convenient to schedule field trips by class grouping instead of individual students. The

SELECTING ENROLLEES (Continued)

teachers can plan to exchange home-rooms occasionally and thus give both teachers and students a change.

RECRUITING TEACHER AIDES

The staff of seven teachers working with 180 students gives a rather large load per teacher. Any additional help the group can get will be of great benefit in laboratory activities and on field trips. Some possible sources of volunteer help might include:

1. A teacher who has just completed his practice teaching assignment within the District. He may desire additional experience and perhaps a recommendation from the staff could cinch a permanent assignment in the fall.
2. Parents who have been known to be active in assisting elementary school teachers during the regular school year might be used either full or part-time.
3. College students could perhaps earn credit by participation in such a program during the summer. A small salary could be offered to this prospect.
4. Twelth grade laboratory assistants may be eager to help out and can be used effectively.

The object, of course, is to reduce the teacher-pupil ratio to as close to the 1-12 as possible.

EXAMPLES OF DAILY PROGRAMMING

On the next several pages are examples of how specific aspects of the Novato Unified School District program were detailed.

The staff usually arrived one hour before the starting time and reveiwed what was to happen that day. Often last minute changes were made.

At the end of each day the staff met, if necessary, for an additional hour to evaluate the day's program and check to see if any additional work needed to be done for the following day.

The examples of programming on the following pages were chosen so as to include several different types of typical days and topical areas.

THE FIRST DAY: SETTING THE TONE - SAMPLE PROGRAM -

The first week emphasized the fact that overpopulation lies at the base of many environmental problems. The week was called "People Problems". Since the program was to be an action course, the first day had to do more than just introduce another conservation course. There were four basic objectives that had to be achieved.

1. Introduce the staff.
2. Present an over-view of the course.
3. Introduce the concept of overpopulation.
4. Set the mood as one of involvement and activity rather than a confined classroom approach.

In order to accomplish these objectives the following tenchiques were used:

1. An outdoor activity was designed to stimulate interest in the environment and environmental problems.
2. An indoor activity to graphically illustrate the problem of overpopulation.
3. An outstanding speaker was to set the theme of overpopulation

THE FIRST DAY: (Continued)

and demonstratively prove the value of using resource people.

4. An up-to-date film on population pressures was incorporated into the days schedule.

THE FIRST DAY OF SUMMER SCHOOL

TIME	EVENT	DETAILED PLAN
8:15	HOMEROOM	Take attendance and give students verbal outline of day's activities. Other necessary announcements.
8:20	LECTURE HALL FOR STUDENT ORIENTATION	1. Introduce staff members. 2. Present brief over-view of summer's program. 3. Hand out and explain Scavenger hunt procedures. There were two levels of instructions; One for the 4th - 7th graders One for the 8th - 12th graders (See Page 20 for Scavenger Hunt)
8:55	SCAVENGER HUNT	The teachers should go out with the students and spend time talking and discussing the significance of items illustrating littering, erosion, and uses of aluminum. Plant and animal interrelationships can be observed. The physical plant (school site) can be explored in order for the students to become familiar with it. Hunt items should be checked by assigned teachers. As each "team" completed all the items listed they were given a reward of one candy bar each. Trash containers were made available but not mentioned by the staff. If there was any litter left when all were through, an example was made of it with regard to the individual's responsibility for litter.
10:00	FILM	"The Squeeze" is a film that shows people of all kinds squeezed into the confines of rooms, buildings, streets and cities. To heighten the feeling of being overwhelmed by too many people the film was shown in a small classroom with all chairs removed. The students were jammed in to view the film. The effect was quite graphic as well as providing a good introduction to the topic of the guest speaker.

TIME	EVENT	DETAILED PLAN
10:30	BREAK	A short break was provided prior to all students assembling in the large lecture hall.
10:50	GUEST SPEAKER	Dr. Richard Harriman, from Stanford and assistant to Dr. Paul Ehrlich was the guest speaker. He spoke on the problems with people and did an outstanding job of giving us the feeling of the problems facing our finite sized planet today. Allow time for questions from students.
11:55	WRAP UP AND HOME-ROOM DISCUSSION	Students return to their home-room. Allow students to express their feelings about the things they had seen and done that morning. Recommend Dr. Ehrlich's book "The Population Bomb" as excellent reading for more information. Hand out the master calendar for the course to each student. Hand out the blanket field trip permission slips. These should be taken home to be signed and returned.
12:15	DISMISSAL	The students were dismissed to go home.
12:20	TEACHER EVALUATION AND PLANNING	The teachers spent time evaluating the day's activities and made plans for the following day.

SUMMER SCHOOL CONSERVATION EDUCATION

Directions: Scavenger Hunt

1. Divide students into seven color coded groups (each will be given a colored tag from prior grouping) and each teacher takes one group.

2. Present list of items to find - all are on campus.

3. Give group guidance as to how they can most efficiently hunt for items (dividing into smaller groups within color group - each taking certain items on list).

4. Whistle will blow after organization time so all groups may start at the same time. (Supply table will be provided in each assembly area to include ruler, paper, pencil).

5. Each group will be told what teacher to find to check their items off (different teacher from starter). Teachers will be dispursed at area where hunt ends.

ELEMENTARY LEVEL
CHECK LIST

Things to Find

1. An oak leaf
2. Make a cup that will hold creek water and collect some.
3. A piece of algea
4. A bay leaf
5. A stone smoothed by water
6. A piece of dried grass 6"
7. A 1/4" piece of buckeye tree bark
8. An oak leaf partially eaten by an insect
9. A thistle
10. Five different seeds
11. The number of outside doors leading into the Science Bldg.
12. A small piece of wood showing evidence of worm eating
13. One ant alive - make a paper cage to keep it in
14. A whole acorn
15. A grasshopper
16. A cup of sand
17. Make a sketch of poison oak
18. A dead yellow jacket
19. A dandelion top with no seeds
20. An earwig
21. An example of aluminum

Sketch a Map of the School and Identify the following:

1. An area showing signs of erosion
2. Bus loading area
3. Wood and metal shop
4. Library
5. Math-Science Wing
6. The number of cement squares there are under the trees
7. Sketch in the number of benches under the trees.
8. Plot a snake hole you've found.

ADVANCED CHECK LIST

1. An example of mutualism
2. A specimen of recycling organic matter
3. A specimen of recycling litter
4. A parasite
5. An example of the sporophyte generation of a flowering plant
6. An example of Bacillus Subtilis (Tell where it can be found)
7. A specimen of Drosophila species.
8. An example of aluminum
9. An example of green algae
10. An object not easily recycled by nature (other than aluminum)
11. An example of a photo-chemical reaction
12. An example of an energy form conversion
13. An example of an electro-chemical reaction

SAMPLE PROGRAM: THE EIGHTH DAY

The eighth day of the conservation program was one of activity and student involvement. The first part of the second week had dealt with the problems of transporting masses of people with ease and without undue air pollution.

The last two days of the week were used to study the ever-increasing problem of solid waste disposal. When the program was in its early planning stages, the staff had hoped that sudents would already be engaged in community projects by this time and had, therefore, scheduled as a guest, a high school junior. He had developed a conservation program on his own the previous spring using slides and closed circuit television. His presentation, it was hoped, would encourage students in the summer program to continue their own projects with enthusiasm.

TIME	EVENT	DETAILED PLAN
8:00	HOMEROOM	1. Recap previous day's activities a) the field trip to auto assembly plant b) the field trip to the sanitary disposal plant. (The large group is often broken down into sub-groups for separate field trips and then switched at a later date and the trips repeated). The sharing of experiences not only helped consolidate learning experiences but also served to introduce the students to the trip they had not taken yet). c) Review of ecotactics seminar
8:30	INDIVIDUAL AND GROUP PROJECT PRESENTATIONS	1. Recycling program explained to the entire group and those interested signed up. A 10th grader proposed the idea and continued this project with the eventual collection in a 4 week period of: a) 13 tons of newspaper b) 750 pounds of aluminum c) 2 tons of glass d) 1 ton of tin e) 1 ton of mixed tin and aluminum The project was continued in the fall by high school students. See guide to setting up a recycling program in the appendix.

THE EIGHTH DAY (Continued)

TIME	EVENT	DETAILED PLAN
		2. Consumer handbook project was presented to the entire student body. The objectives of presenting environmental problems and specific suggestions the individual could do were given. Interested students could sign up for participation in that group. A handbook was produced and a copy is included in the appendix, page 63.
9:05	GUEST SPEAKER	Senate Candidate (now Senator) Senator Peter Behr spoke on the subject "Cars of the Future". He was a pioneer in the conversion of his car to propane fuel. His talk told us why he had made the decision and what he considered the advantages of such a move. Other solutions to private transportation were covered and then all students were taken outside to view his car.
10:00	BREAK	
10:15	FILM	In the lecture room a film called "The Third Pollution" was shown. It dealt with littering and problems of waste disposal. The need for finding better ways of cutting down the waste materials and improving waste disposal methods was emphasized.
10:50	PROJECTS	Individual and group projects were pursued in various classrooms and laboratories. The teachers provided assistance when needed and acted as resource people. A list of projects for students can be found in Chapter 6.
11:45	AWARENESS PROGRAM	John Briggs, a high school junior, presented what he called "An Awareness Program". It was designed to use a multi-media approach to show people the many environmental problems we now face. The program used videotape, slides, tape recordings and a lecture. He showed what life might be like in the future when man must live in a 8' x 8' cubicle and never venture outside because of air pollution. He depicted a world devoid of trees, animals and a ravaged world in which man is slave to machines that sustain his life. All forms of pollution were shown on slides, accompanied by appropriate music, without comment.

THE EIGHTH DAY (Continued)

TIME	EVENT	DETAILED PROGRAM
11:45 (Continued)		The pictures spoke for themselves. The impact was tremendous and it was an outstanding example of what a young person could do.
12:15	CLASS DISMISSED	
12:20	TEACHERS EVALUATION AND PLANNING	

SAMPLE PROGRAM: FIELD TRIP

This field trip was scheduled on the fifteenth day of the program and was designed to give the students a chance to observe, chart, study and compare life forms at various points along the Petaluma River. They followed its course from its source north of the city to its mouth in San Pablo Bay. The students were given the opportunity to study the river both macroscopically and microscopically and to observe the effects of effluents, agricultural run-offs, marina housing developments and recreational usage.

PREPARATION

Prior to the field trip, one teacher surveyed the river to pick at least five different observation points at which students could be deposited to make their studies. The representative areas included:

1. The source region in the country north of Petaluma
2. In the city of Petaluma
3. Just south of Petaluma near the mouth of San Antonio Creek
4. Near a Marina Housing Development
5. At a salt water marsh near the mouth

Permission from private land owners bordering the river was gained verbally and the owners were given the expected date and time the buses would arrive.

As the study entailed a microscopic look at a river, a group of students was chosen from each of the seven home-room groups. These students did some preliminary work with the microscope and sterile techniques.

A representative from the local water district donated certain materials and his time to instruct the students on the correct procedures as used by the state of California. The object was to determine the purity of a river-water resource.

The cross-grading structuring showed its value as students from all grade

levels took part in this aspect of the field trip. Each person performed a specific task that all of the others relied upon.

Sterile technique was stressed and each step of the procedure had to be mastered by each member before the next step was presented. Another opportunity was thus provided for some students to help others and, thereby, improve their own understanding of the total concept.

DAY OF THE RIVER SURVEY

The classes were divided into four groups to cover the designated river sites. Directions, maps, collecting bottles, note pads, and a list of questions were issued to the students. Notes were to be taken of all life forms they observed. Water samples were to be taken in sterile sample bottles for coliform testing back at the lab. Some of the specific questions asked included the following:

1. How many of each animal species do you estimate is present in your study area?
2. What kinds of plants exist and seem to thrive? Can you estimate percentage of each?
3. What plants seem out of place or seem to be dying?
4. What evidence do you see of man's influence on the environment in your study area?
5. Try to rate the study area as to whether it is:
   a) Very alive
   b) Dying
   c) Dead
   d) Recovering

The sterile collecting bottles were provided by the local water district

SAMPLE PROGRAM: FIELD TRIP (Continued)

and these were distributed to the collecting teams. Instructions as to how to remove the top and where to collect the sample of water were given. Two bottles were provided for each collecting site; one for a top and one for a bottom water sample. Records were kept as to the date, time, temperature and location of each sample.

Care was exercised in keeping the samples as cool as possible until they were used, as a rise in temperature might affect the living organisms within the sample.

All students and teachers returned to school about one half hour before the end of the school day. This allowed for collected material to be filed and refrigerated for use on the following day.

FOLLOW-UP PROCEDURES

The day following the field trip was spent in organizing notes from each group. Samples were identified and incubation procedures began for the water specimens.

Sterile pipettes were used to transfer the samples from the jar to the incubating tubes. A period of six days was required for incubation and transfer of organisms from one tube to another. Each time, sterile techniques were adhered to until the results could be tabulated. After a sterile sample is drawn, the remaining water samples were examined by all students.

Students got together in their collecting site groups to discuss what they had observed and tally results of animal and plant population counts.

After all the information was compiled the entire student body was assembled in the large lecture hall.

A large map of the Petalume River was drawn on the blackboard with each survey site numbered. Representatives from each survey group then gave their

reports on their specific site.

When the macroscopic and microscopic reports were completed and filled in on the large map it was possible to see the changing health of a river from its source to its mouth.

The level of microorganisms (from the coliform tests) changed in relation to the use to which the river had been subjected. It was possible to see that a river has the ability to purge itself of polluting agents in a relatively short distance if given a chance.

There were many questions left to be answered, such as:

1. What made the river seemingly die as it passed through Petaluma?
2. What is the cleansing action a river seems to have as it follows its course?
3. Why are marsh and tideland areas important to local environments?
4. What kinds of things can be done to improve the environmental quality of a river?

So often we tend to look at an unpleasant site, as in the case of a polluted body of water, and can only react from an aesthetic viewpoint. This field trip allowed students to extend their aesthetic observations to the world of the microorganism and, thereby, gain an even truer causal picture of the self destruction wrought by mankind. This synthesis of objective and subjective observations gives the students the tools with which to rationally discuss water pollution problems with people who have the power to correct it -- now.

SAMPLE PROGRAM EMPHASIS

WILDLIFE CONSERVATION - 1 WEEK

OBJECTIVES

1. To present some of the problems in wildlife management.
2. To familiarize the students with the different types of wildlife found in the local environment.
3. To acquaint the students with the functions of different wildlife conservation organizations on the state and local levels.
4. To present a continuous program with each day complimenting the next with additional information, thus building a progressively positive program.

PROCEDURE

1ST DAY: GUEST SPEAKER — A speaker from the Department of California Fish and Game explained the role of the department. He detailed some of the major problems in wildlife conservation in California and how some of these problems are being solved today.

A slide show by a staff member, dealing with different plants and animals found in the immediate area was presented.

2ND DAY: FIELD TRIP — A field trip to the Vacaville State Game Bird Farm was taken. A guided tour was given and students observed the equipment and birds that were being raised. They were also shown some new birds that were being bred for later introduction into the state.

3RD DAY: FIELD TRIP — The entire student body took an all day field trip to the Alameda Memorial Beach Park. Here a naturalist gave a short talk about the animals found along the beach and outlined problems, industry and shipping are causing in San Francisco Bay.

SAMPLE PROGRAM EMPHASIS: WILDLIFE CONSERVATION (Continued)

4TH DAY: GUEST LECTURER SLIDE PRESENTATION — Dr. Clerin Zumwalt, representing the Audubon Society, presented a film and slide presentation of the Audubon Canyon Ranch, Bolinas Lagoon and the role of the Audubon Society. A field trip was planned to visit the ranch area.

5TH DAY: EVALUATION AND NATURE HIKE — The fifth day was one of review and evaluation. A short hiking trip into the field area near the school gave the students an opportunity to demonstrate their newly gained knowledge of their own environment and wildlife habitats.

It must be remembered that, although a specific week was set aside for the concentrated study of wildlife conservation, there was a great deal of overlapping and reiteration during the other periods of time. This was true of all the areas studied and served to emphasize the ecological relationships that exist in the world around us.

PROJECTS AND ACTIVITIES

In an action type course such as this there is a need for a great many individual and group projects that can be accomplished by students in all grade levels. Many projects overlap into different ability levels and some, due to their complexity, should only be attempted by the upper level students.

The ideas listed on the following pages were some of the more effective projects used to accomplish the program's objectives. They can be considered a starting guide for any school district embarking on such a program. The staff will have to make decisions as to the ability of the students and whether or not they would be successful with specific projects.

Many ideas for experiments and studies will be suggested by the students. Often, by following these student-activated projects, the end product will be superior to those that were teacher directed.

There was no need to set time limits for completion nor was there ever a need to limit the group sizes. Some students even divided their time between several projects and seemed to learn from each activity.

As projects and activities get underway and begin to show some results, have representatives from the activity report on progress to the entire student body. This keeps the interest level high and acts as motivator for the non-self-directed student.

EXAMPLES OF STUDENT PROJECTS AND ACTIVITIES

Project suggestions with an asterisk (*) beside them indicate a secondary level of difficulty.

I. DEVELOPING OBSERVATION TECHNIQUES:

1. Scavenger hunt using such things as: acorn, leaf showing evidence of worm eating, and five different kinds of seeds. An example hunt list can be seen on page 21.

EXAMPLES OF STUDENT PROJECTS AND ACTIVITIES (Continued)
* Secondary level recommended

2. A short walk looking for all observable signs of animal life. Sketch or bring back the signs found, such as abandoned bird nests, gnawed branches, animal tracks and feathers.

* 3. Sense sharpening nature walk. Blindfold the students and drop them off at intervals of 25 yards. Let them absorb all sounds of nature for at least 20 minutes. This is an excellent way to test their powers of observation without the use of sight.

* 4. Analysis of bird territory. Using an area of approximately 20 acres, map out the area showing nesting sites, types of vegetation or cover, and determine which species are present. What are the population densities for each species of bird?

* 5. Wildlife photography. It is recommended that 35 mm cameras be used for this project as most "instamatics" will not focus closer than three feet. A slide show near the end of the course may be given by those students who were involved in taking the pictures. A library collection of the best slides could be kept and additions made to it each year. Duplicate collections could be made and distributed to other schools.

II. UNDERSTANDING PATTERNS IN NATURE

1. PLANT LIFE

a) Tree identification: Have the students look at the leaves on a tree. How are they spaced on a branch? Can you use this information to classify trees? Using your leaf or needle classification see if someone else can locate the same tree. Use tree guides to correctly identify the trees in your vicinity.

EXAMPLES OF STUDENT PROJECTS AND ACTIVITIES (Continued)
* Secondary level recommended

b) Plant identification: Using plant guides and walking field trips determine what local plants can be used for sources of food. Collect samples and bring back for consumption. Other uses for native plants may also be studied, such as medicine and dyes.

* c) The effect of automobile exhaust emissions on the growth of plants. Due to their availability and sensitivity to environmental conditions, various species of coleus plants are recommended. Care must be taken to keep all environmental conditions the same with both the control and experimental plants. The only variable should be exposure to exhaust. A plastic bag with a glass tube entering it for application of water and auto exhaust was found to be the easiest method for keeping the environment constant.

2. SOIL

a) Check the rate of water penetration into the soil at different locations. Is there a relationship between the compactness of the soil and the rate of penetration?

b) Using wet paper towels, test the rate of evaporation in different areas (low grass, thick brush, heavily wooded, south vs north sides of hills, etc). Place towels on the ground and others in a hanging position at different heights. What could cause the different rates of evaporation? How would this affect plant life in an area?

c) Observe all living creatures in a 1 square foot plot. Set up several plots in different areas and keep records for two weeks. Try to keep records of changes that take place and perhaps make a few night visits for an evening count as well.

EXAMPLES OF STUDENT PROJECTS AND ACTIVITIES (Continued)
* Secondary level recommended

d) Examine carefully 1 cubic foot of soil. Dig up and sift and sort a cubic foot of soil from different regions locally. Record all organisms found and any changes noted in the soil structure. Can any relationships between the living organisms be seen?

* e) A study of soil pH. pH paper, distilled water and several samples of soil are all that is needed for this study. As a result of this examination a student should then find out which types of plants do best in certain types of soil. Be sure to include heavy and light, loam, sandy, clay, and recently burned over soil.

* f) Streambed Model: With this activity students will learn, first hand, some of the problems dealing with water erosion. The stream table should be long enough to allow for many variations in the stream's course.

3. ANIMAL LIFE

a) Observe just one insect. Have the students collect as much information as possible by experimenting and observing. What kinds of things can you find out about it? Does it see? How can you tell? Does it have a sense of smell and how could you test this?

b) Make a wildlife survey of a particular area. Use a tally sheet and note weather, date, time, type and number of animals and their activities using data collected. Construct a wildlife map of the area. Is there a food chain operating here?

c) Photograph and identify wildlife of a specific area.

d) Identify animal tracks in varying nearby areas. Are there certain animals that frequent woodland areas, farmland areas, or areas near water? Make plaster casts of animal tracks and build a display.

EXAMPLES OF STUDENT PROJECTS AND ACTIVITIES (Continued)
* Secondary level recommended

* e) Make a list of natural predators for each animal in specific areas. Can you find some natural predators which could take the place of pesticides or herbicides in a home garden?

III. MAN'S EFFECT

1. Keep a record of the amount of water consumed and used in your home. Make suggestions as to how the amount used could be diminished.
2. Count the number of electrical appliances in the home. Count the number of lights. How many of your electrical gadgets are really not needed? Keep in mind that most forms of electrical power generation methods used today cause pollution and destructive environmental changes.
3. Determine the amount of solid waste material thrown away at your home for one week. Think of ways in which this could be reduced. Pick a week and initiate your own reduction of waste procedures. Keep records and report to the class the results.
4. Make a poll of your community as to the number of cars per family. At different times of the day record the number of people in each car as it passes by a certain point on the road or highway. Are we making the most use of our cars? Can you help to organize car pools? How are you getting to school? Start a bicycle club and develop its popularity at your school or in your neighborhood.

* 5. Design a rapid transit system for your county. Think of ways to make it desirable enough to get people out of their private cars to use it. Plan a field trip to a nearby transit system if there is one.

6. Take an attitude poll regarding the "ideal" family size. Does it differ when posed to the community as opposed to the high school student?

EXAMPLES OF STUDENT PROJECT AND ACTIVITIES (Continued)
* Secondary level recommended

*7. The closed ecosystem we are concerned with is the Earth. Can you decide on ultimate population limit? How much area does an individual need in order to live adequately? Remember that the greater the number of people in an area, the less privacy and open space.

What life style will you settle for? Should population be limited in your community? How can this be accomplished? Phone someone on the local planning commission and ask them to discuss this problem with you.

8. Check with the local SPCA and find out the number of stray dogs and cats picked up each month or for the previous year. Find out also, how many were adopted.

In Marin County for just one year the figures were amazing: 7,000 cats were brought to the society; 600 adopted. Three thousand dogs were brought in and 1,000 adopted. What does this mean?

* 9. Design a home of the future. Students who have had at least one year of drafting experience should be able to incorporate many of the ideas learned in the course dealing with noise, waste and other problems.

* 10. Population studies using the Fruit Fly (Drosophila melanogaster). With a given amount of space and food, what are the effects of unchecked population growth?

IV. COMMUNITY ACTION PROJECTS

1. Organiza a city-wide cleanup for a Saturday. Get local church and service groups to help out. Establish it as an annual event.

2. Have a survival walk to raise money for conservation aims such as promoting passage of park bonds or state ecological bills.

3. Pick an area in your city and clean it weekly.

EXAMPLES OF STUDENT PROJECT AND ACTIVITIES (Continued)
* Secondary level recommended

4. Make a slide show or movie to show to interested school and community groups. It should emphasize a specific point or idea or promote conservation in general.
5. Organize a campaign to make the sale of non-returnable bottles illegal. South San Francisco accomplished this.
6. Establish a recycling program for such materials as paper, aluminum, tin and glass. See detailed outline on page 42.
7. Write songs and poems with a conservation theme.
8. Make posters and collages that can be placed in local store windows to promote specific environmental suggestions.
9. Write letters to local and state officials regarding pending legislation relating to ecological problems.
10. Publish a conservation newsletter to be sent home with the students. It should include information about the school activities plus original poems, songs and drawings.
11. Contact local newspapers and get coverage of any special events or activities undertaken by the students.
12. Find local areas that will benefit by having a ground cover to prevent soil erosion. Contact the State Highway Department for information on obtaining ivy or iceplant cuttings.

V. SPECIAL PROJECTS

1. Construct a compost pile at home. Try organic gardening.
2. Construct a closed ecosystem. See detailed instructions on page 40.
3. Design and construct various methods of distilling and purifying water.
* 4. Write a unit on conservation education that can be taught to elementary school students by any teacher. Make a list of supplementary reading

material that libraries could order. Make a kit of supplies that could be checked out by teachers for use in the classroom.

This is only a "starter list" and many more ideas will be spawned from the staff members as the program is firmed up near the opening day. Do not be afraid to learn along with the students in the process of trying something new. It is part of the excitement of the course.

EXAMPLE SPECIAL PROJECT

SUMMER CONSERVATION CLASS

ESTABLISHING A CLOSED ENVIRONMENT

ECOSYSTEM IN A GALLON JUG

Many basic principles of biology may be studied through the establishment and maintenance of fresh water aquaria. Fundamentals of phoptosynthesis, gaseous exchange, food relationships, respiration, ingestion of food and water, carbon and oxygen cycles, predation, parasitism, herbivore relationships and growth are but a few of the studies that will become evident to the keen eyed student. Here is the procedure in setting up a closed ecosystem.

1. Place water and sand in a clean gallon jug. Let it stand open to the air at least 24 hours to allow the chlorine in the water to dissipate. (Chlorine is a chemical put in water to kill living organisms and it is lethal to many invertebrate species as well as aquatic vertebrates.)
2. Place aquatic plants such as Anacharis, Cabomba, Myriophyllum, or Water Cress on the sand. Use a long stick to push the roots or stem ends into the sand.
3. Add a small amount of green algae.
4. Add two tablespoons of creek water or stagnant pond water. They will provide some cyclic invertebrates.
5. Let jug stand for about one week in a well-lighted but not direct sunlight location. This will give tiny animal life a chance to develop.
6. Add at least one pair of guppies, sticklebacks, mosquito-fish or other tiny fish.
7. Add one or two snails to the jug. Pond snails or ramshorn are fine.

(Closed Ecosystem Continued)

8. Cap and seal the top with wax.

Now only time will tell whether you have proceeded correctly or not. You should keep daily records of developments as they occur. If death occurs, attempt to determine the cause.

Here are some questions to think about and answer.

1. How long do you think it will be before all the vertebrates are dead?
2. How long do you think it will be before all the invertebrates will die?
3. What will survive the longest and why?
4. Will any tank eventually balance all biological and chemical factors and thus allow inhabitants to live indefinitely?
5. How will oxygen be renewed?
6. How will CO_2 (Carbon Dioxide) be utilized?)
7. Where does each animal secure its food?
8. Where do the plants get their nourishment?
9. Does reporduction occur? Is there a limiting factor?
10. Is there a carbon cycle?
11. Is there a nitrogen cycle?
12. Is there any obvious decay taking place and what causes it?

A COMMUNITY PROJECT

INITIATING A RECYCLING DEPOT

I. THE FRAMEWORK

1. LOCATION: In selecting a site on which to locate your recycling depot you should consider its accessibility to the community. Since you should also consider the manner in which the depot will be staffed after it is in operation, you may decide that a vacant area on school property (with a built-in supply of willing workers and teacher supervision) would provide the best site. In addition to your main location it may be advisable to locate a collection container at several convenient places to encourage the initial use of your depot. Remember that you must have available transportation to empty such containers frequently.

2. COLLECTION BINS: Your local refuse collection agency should be able to provide you with one or more refuse containers (debris boxes), should you decide to use them as your permanent collection containers. It may prove more economical to have student and parent volunteers constructing a simple shed in which to store newspapers and large collection boxes, oil drums, and fiber glass barrels, any of which can be obtained from local stores, are excellent for use as the permanent storage containers for collected aluminum, tin and glass. Boxes of this size may be painted, labeled and deposited at various locations for collections. Slightly smaller boxes should be available at the depot for the daily deposits. Collection boxes should be emptied and sorted daily.

3. RECYCLING ARRANGEMENTS: Call the different companies in your area which accept glass, aluminum, tin and newspapers to be recycled. See Appendix. If there is no existing agent who accepts newspaper to be recycled, try to obtain the sponsorship of your largest local paper. Petitions could

be circulated and letters written directly to the newspaper supporting the idea that the paper has a responsibility to sponsor such a drive. If a local organization in a neighboring community has already begun a recycling effort, you may wish to deliver your collected materials to it and accept a percentage of the financial reimbursement it receives.

4. TRANSPORTATION: It will be necessary to obtain the use of a pickup truck to transport collected material to the various recycling agents. The local school district may have a large truck available for this use. Good publicity could result in the donation of a driver and truck from a local store or business. If no volunteer arrangements can be worked out, call various truck leasing companies to obtain the best rental or lease rate. The reimbursement from the recycling agents can be used to cover any transportation expenses.

II. GETTING INTO OPERATION

1. ALERTING THE COMMUNITY: Information sheets should be printed to explain the basic need for recycling material in our world today. It should give specific instructions on how to prepare the material and where it will be collected. Volunteers will be needed to pass these out in their communities and also at local shopping centers. These volunteers should be well informed and able to answer questions that might arise during such distribution.

Another way to initiate the saving of recyclable material is to have volunteers bring labeled paper bags (aluminum, glass, tin) to several of their neighbors. After explaining the need to recycle and asking them to participate, the volunteers may even offer to collect the material once a week and bring it to the depot themselves. The location of

prominent collection containers at several convenient sites also helps to initiate community participation.

Publicity is very important. Get as much coverage as possible from your local paper. Perhaps you can obtain community service time on a local radio or T.V. station.

2. DEPOT MANAGEMENT: Set up a regular schedule for volunteers to staff the depot. Monday will be an especially busy day after a weekend of depositing. Collected material will have to be sorted and transferred to your permanent collection containers. Loose newspapers will have to be tied, unprepared cans flattened and glass smashed to facilitate handling and storage. Use hammers to break the glass containers against the sides of a large metal garbage can. Workers should wear protective goggles and gloves. If collection boxes have been placed at other locations in the community, they must be emptied and sorted frequently.

III. POINTS TO REMEMBER

1. Everyone likes to know what they are accomplishing. Obtain as much follow-up publicity as possible explaining how many tons of material or how many trees the community has managed to save during a certain period of time. This type of reinforcement will help keep the community involved in the recycling depot.

2. Anticipate the rainy season. It will be difficult to stop operation for several months after you have just recruited "recyclers" in your community. Explore available possibilities for weather-proofing your depot. If large sheets of plastic can be obtained, they can be nailed over the top of the collection containers. If your location is on school property, perhaps there is a vacant room or storage area that can be con-

verted into a collection station for several months during the winter. If it is not feasible to continue operation through the rainy season, plan to alert the community several weeks in advance that you will be closing temporarily. Then be sure to remove all collection containers or you will continue to receive deposits.

3. THE ONLY ABSOLUTE NECESSITY FOR ESTABLISHING A RECYCLING DEPOT IS TO HAVE WILLING AND EAGER WORKERS -- all other obstacles are surmountable.

IV. EVOLUTION OF THE PROJECT

Eventually the entire operation may evolve into a community accepted 2 day a week operation. The Novato recycling center became known as the Survival Center and received only properly prepared material on Saturdays and Sundays.

It consisted of a portable shelter which could be put up and taken down the same day. Besides accepting properly prepared material for recycling, students at the shelter issued information concerning environmental problems.

A local warehouse facility was used for storage and trucks made the rounds to other survival shelters in the county to pick up material brought in by local residents.

The profits from the sale of the materials collected were divided so that 50 percent went to each school participating and 50 percent was used for the operational costs including transportation, personnel to man the centers and publicity.

EXAMPLE OF A HOME BULLETIN - STUDENT PROJECT

WHAT CAN YOU DO?

1. Buy postcards and keep them handy. When you read or hear of something that concerns you, send a postcard to your congressman, governor, or senator.

2. Keep your car clean and well-tuned. (35% of smog is from badly tuned engines and bad spark plugs.)

3. Organize car pools, use public transportation, ride bicycles, or walk where possible.

4. Don't overfill your automobile gasoline tank.

5. Read content labels and refuse to buy anything containing DDT or Chlorinated hydrocarbons.

6. Don't litter and teach non-littering principles to your younger brothers and sisters.

7. Carry a litter bag in your car.

8. Don't use a spray aerosal when avoidable. Example: use a stick or cream deodorant; use a liquid or paste furniture polish.

9. Use reusable glass containers whenever possible. Save and reuse plastic containers. Don't buy non-returnables, they don't break down.

10. Begin dairy delivery of milk in glass bottles and call the dairy to state you are having milk delivered BECAUSE reusable glass bottles do not contribute to pollution.

11. Do not use plastic or styrofoam cups. They don't break down.

12. Reuse paper bags. Use disposable plastic at a minimum.

13. Use terrycloth "fingertip" towels instead of paper napkins for table use. Use a different color for each member of the family.

14. Put lunches in lunchpails instead of using a new paper bag each day.

15. Prepare all cans for recycling immediately after use and store in properly marked container.

16. Do not use potholders, floor tiles, ironing board covers that contain asbestos.

17. Do not waste or abuse firewood, electricity, gas, water, or heat.

18. Change our idea that technology will solve our problems and begin to realize that we must individually each become part of the solution.

REMEMBER: What seems the cheapest, most convenient way now is not necessarily the best or cheapest way for man now or in the future.

EVALUATION PROCEDURES

PROGRAM

The summer school evaluation procedures involved both the teachers and the students.

As each day's program ended the teachers would get together and go over how well the objective had been met. They would attempt to be critical of specific parts and suggest ways of perhaps making the program better in the future. If an activity was to be continued the following day, the staff would revise, where necessary, the procedures or techniques used. This daily evaluation procedure insured maximum communication among all members of the staff. It was an excellent aid in keeping the program on a finely tuned basis.

At the end of the six weeks of summer school each member of the staff was asked to write a personal evaluation of the over-all experience and to make specific suggestions as to how the program might be improved in succeeding years.

The suggestions most encountered have been incorporated into this guide and should allow a school district to set up and operate a similar program with a minimum of major problems.

The students were asked to write evaluations at several points in the summer program. Once or twice after a particular subject area was covered and at the end of the course. Daily discussion was held briefly with home-room groups concerning the previous day's activities and ideas gleaned for improvement.

The over-all enthusiasm for the course was easily noted, if by nothing else, by the fact that enrollment was maintained at 100%. This was a definite exception when compared to other regular summer school classes.

A parental questionnaire might also be considered to find out what kinds of behavioral changes, if any, had occurred in the home as a result of the program.

EVALUATION PROCEDURES (Continued)

STUDENT

No formal grades were issued for the work accomplished. Students were, however, given recognition verbally and their work, when possible, was displayed to other students and visitors to the program.

Students in the 9th through the 11th grades were given five units of science credit which was entered into their records. Elementary students were sent an announcement of completion of the conservation course. This was entered into their records.

The summer school staff and district should agree on the minimum standards for issuance of credit.

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SOURCES OF INFORMATION

FREE AND INEXPENSIVE FILMS: For ease in ordering, these films have been listed by distributors.

Association Films, Inc.
25358 Cypress Avenue
Hayward, Ca. 94544

Sounding on San Francisco Bay - 13 1/2 min., color, free. Summarizes the findings of the three-year Bay study made by the BCDC.

Glen Canyon - 29 min., color, free. The story of the loss of a beautiful canyon in the name of progress as man continues to dam the rivers.

Atlantic Richfield Company
55 Hawthorne Street
San Francisco, Ca. 94105

California and It's Natural Resources - color, free.
Let's Keep America Beautiful - 16 min., color, free. Stresses importance of keeping our highways, parks, beaches and other resources clean.
Heritage of Splendor - 18 min., color, free. Narrated by Ronald Reagan. Litter prevention activities are photographed against some of the most beautiful scenic areas in the United States.

Citizenship Legislative Dept.,
Oil, Chemical & Atomic Workers Int'l. Union
1126 - 16th Street
Washington, D.C. 20036

By Land, Sea and Air - 31 min., color, $5/day. Effects of pesticides on farm workers and environment of California

Coca Cola Bottling Co. of San Diego
1348 47th Street
San Diego, Ca. 92102

We're On Our Way - color, free, shows the litter-prevention and beautification projects of 11 national youth groups.

Conservation Foundation
1250 Connecticut Ave., N.W.
Washington, D.C. 20036

A Matter of Time - 27 min., color, $10.00. A historical approach to environmental deterioration.
For All to Enjoy - 20 min., color, $10.00. Satirical approach to uncontrolled development in National Parks.

Encyclopedia Britannica
425 N. Michigan Ave.
Chicago, Illinois 60611

Air Pollution - 18 min., color, $8.00. Health problems posed by air pollution.
Water Pollution - 20 min., color, $8.00. Health problems posed by water pollution.

Sources of Information (Continued)

Population Ecology - 28 min., B/W. Ecological consequences if population is not brought under control.
Our Changing Environment - 17 min., color, $8.00. Man's increasing power to control his environment has created new pressures and problems for the modern city.
Our Crowded Environment - 11 min., color, $6.50. Relates to problems of overpopulation.

Environmental Control Administration
12720 Twinbrook Parkway
Rockville, Maryland 20852

A Day at the Dump - 15 min., color, free. Story of Kenilworth Dump in Washington, D.C. and its planned conversion to a public park.
Pandora's Easy Open Pop-Top Box - 15 min., color, free. Dramatic presentation of the effects of uncontrolled urbanization.
The Third Pollution - 30 min., color, free. Graphically describes America's solid waste problem and demonstrates new techniques of solid waste management.

Extension Media Center
University of California
Berkeley, Ca. 94720

Cities in Crisis - 22 min., color, $13.00. Impressionistic film of urban sprawl and unplanned growth.
Clean Waters - 20 min., color, $9.00. Illustrates dangers of water pollution and shows proper sewage treatment.
Noise: New Pollutant - 30 min., B/W, $7.50.

Hank Newenhouse
1825 Willow Road
Northfield, Illinois 60093

The Squeeze - 10 min., B/W, $12.00. Throngs of people, jammed highways, rushing commuters, starving children graphically describes population problems.

Indiana University
A - V Center
Bloomington, Indiana 47401

Multiply and Subdue the Earth - 60 min., B/W, $13.50. World population crisis.
What Are We Doing to Our World? - two parts each 30 min., color, each $11.00.

McGraw Hill Contemporary Films
1714 Atockton Street
San Francisco, Ca. 94133

First Mile Up - 28 min., B/W, $8.00. Problems of air pollution and its affect on human health.

Sources of Information (Continued)

People By the Billions - 28 min., B/W, $8.00.
Poisons, Pests and People - 55 min., B/W, $16.00. Grim results of indiscriminate use of pesticides on wildlife and people.
The Problem With Water is People - 30 min., B/W, color, $16.00. Traces route of Colorado River from beginning to the ocean and discusses its population and misuse.

Modern Talking Picture Service
16 Spear Street
San Francisco, Ca. 94105

Lassie's Litter Bit - 28 min., color, free. The consequences of dropping litter carelessly is graphically shown. Lassie appears as guardian of America's natural beauty and wildlife.

Shell Film Library
450 N. Meridan Street
Indianapolis, Indiana 46204

Food or Famine - 28 1/2 min., color, free. 1/10 of world's surface arable yet must support a world population. Film appeals for cooperation in expanding food production. Shows ways of preventing mass starvation.
River Must Live - 20 min., color, free. Depicts the effects of pollution on a river and how it can clean itself if given a chance.
Living Soil - 20 min., color, free. Explores life in earth's thin layer of top soil. Shows problems and solutions to ravages of soil pests.
Unseen Enemies - 27 min., color, free. Shows costly war between man and insects. Dramatic locust plague and man's defense with modern communications and insecticides.

Standard Oil Company of California
Motion Picture Library
16 Spear Street
San Francisco, Ca. 94105

To Clear the Air - 22 min., color, free. The film points out that while there is no quick, simple remedy for polluted air, industry and government are working to solve the problems.
A Land Betrayed - 11 min., color, free.
So Little Time - 26 min., color, free. Shows water foul of North America and stresses the need for conserving these species.

Sterling Movies, Inc.
6290 Sunset Blvd.
Los Angeles, Ca. 90028

The Last Frontier - 28 min., color, free. Shows the "betrayed land" and offers suggestions on how to save it.

Sources of Information (Continued)

Stuart Finley Productions
3428 Mansfield Road
Fall Church, Va. 22041

Crisis on Kanawha - 20 min., color, $15.00. Shows sources of industrial water pollution and some methods of eliminating it.
Green City - 23 min., color, $15.00. Shows civic action to preserve green space and open space as cities grow.
Urban Sprawl - 21 min., color, $15.00. Asks the question, "Will we tolerate a continuing extension of urban sprawl?"

United States Department of Health, Education and Welfare
Public Health Service
Audio-Visual Facility
Atlanta, Ga., 30324

Tom Lehrer Sings Pollution - 3 min., color, free. A humorous but very effective film dealing with pollution.
Radiation Safety in Nuclear Energy Explorations - 24 min., color, free. Shows what is being done by federal and state agencies to protect the public's health during explorations of peacetime uses of nuclear energy.

Sources for FREE OR LOW COST MATERIALS ON POPULATION, CONSERVATION AND ECOLOGY

Periodicals

Environment Magazine 438 N. Skinker Road St. Louis, Missour 63130	Monthly publication dealing with effects of technology on the environment, published by Committee for Environmental Information. Students subscription - $5.00/year.

Organizations

American Association of University Women 2401 Virginia Avenue, N.W. Washington, D.C. 20037	Resource directory on pollution control 75¢ Anti-pollution pamphlets and study guide 75¢
California Anti-Litter League 333 Montgomery Street San Francisco, Ca. 93104	Film lists, source material, songs - free Banks, seeds, litter bags - slight cost
California Conservation Council 2604 Villa Street Pasadena, Ca. 91107	Leaflets
California Roadside Council 2636 Ocean Ave. San Francisco, Ca. 94132	Variety of leaflets
Conservation Foundation 1250 Connecticut Ave.,N.W. Washington, D.C. 20036	Variety of pamphlets and articles dealing with many aspects of ecology
Isaac Walton League of America 1326 Waukegan Road Glenvire, Illinois 60025	"Clean Water - It's Up to You", an excellent pamphlet on what local citizens can do about water pollution - free Monthly conservation newsletter
National Parks Association 1701 18th Street, N.W. Washington, D.C. 20036	Free or low-cost pamphlets and articles on thermal pollution, noise pollution, pesticides and basic ecology
National Wildlife Federation 1412 16th Street, N.W. Washington, D.C. 20036	Conservation Directory - a guide to all state and national sources of conservation and environment information $1.50. Informational packets on ecology and pollution - special packets from elementary to adult level. Monthly newsletter
Planned Parenthood, World Population 515 Madison Avenue New York, New York 10022	Bibliography, film guide and following reprints: "Eco-Castrophe" by Paul Ehrlich "300 Million Americans Would Be Wrong" by D. Lilienthal. "The Human Race Has Maybe 35 Years Left" by D. Lyle

Population Reference Bureau 1955 Massachusetts Ave., N.W. Washington, D.C. 20036	Good bibliography, source list, and film guide on population - low cost
Portland Center for Continuing Education P.O. Box 1491 Portland, Oregon 97207	"Observing Our Environment," - $3.00 Relates elementary students to the environment
Project Man's Environment National Education Association 1201 16th Street, N.W. Washington, D.C. 20036	Information on curriculum (K - 12) environmental study area
Public Affairs Pamphlets 381 Park Avenue South New York, New York 10016	Pamphlet #421 - "An Environment Fit For People" 25¢ Pamphlet #403 - "The Battle for Clean Air" 25¢
Redwood Region Conservation Council Rosenberg Bldg. Santa Rosa, Ca. 95404	Leaflets
Save-the-Redwoods League 114 Sansome Street San Francisco, Ca. 94104	Leaflets
Scientist's Institute for Public Information 30 East 68th Street New York, New York 10021	A series of excellent workbooks Air Pollution Water Pollution Pesticides Hunger Environmental Education 1970 Nuclear Explosives in Peacetime Environmental Costs of Electric Power Environmental Effects of Weapons Technology Single copies, $1.00, Set of eight different titles, $5.00.
Sierra Club 1050 Mills Tower San Francisco, Ca. 94104	List of publications, pollution and population information, protection of scenic areas
University of California, Extension Division Berkeley, ca. 94720 or Los Angeles, Ca. 90012	List of films for rent, courses, workshops
Zero Population Growth 367 State Street Los Altos, Ca. 94022	Newsletter, brochures, ecology leaflets reprints

Agencies

National Park Service 450 Golden Gate Avenue San Francisco, Ca. 94102	Park Folders
Resources Agency of California Resources Building 1416 9th Street Sacramento, Ca. 95814	A vast amount of material is available relating to all aspects of conservation in California. Write for lists of material available

Write to the following at the above address:

State Dept. of Conservation
State Dept. of Fish and Game
State Dept. of Parks and Recreation
State Dept. of Water Resources

U.S.Army Corps of Engineers 630 Sansome Street San Francisco, Ca. 94104	
United States Atomic Energy Commission P.O. Box 62 Oak Ridge, Tennessee 37830	Many booklets, sources of information, film lists
U. S. Bureau of Reclamation P. O. Box 2511 Sacramento, Ca.	Phamphlets, maps
U. S. Dept. of the Interior Southwest Regional Office 760 Market Street San Francisco, Ca. 94102	Many booklets, pamphlets and maps
U. S. Forest Service 630 Sansome Street San Francisco, Ca., 94111	A Variety of Conservation materials
U. S. Soil Conservation Service 2020 Vilvia Street Berkeley, Ca. 94704	List of pamphlets, maps. A kit will be sent on request of schools
California State Dept. of Public Health Sacramento, Ca.	
San Francisco Bay Conservation and Development Commission 507 Polk Street San Francisco, Ca. 94102	Many pamphlets, reports and maps
Bay Area Air Pollution Control District	

Bay Area Rapid Transit 814 Mission Street San Francisco, Ca. 94103	Pamphlets, reports, maps

OTHER ORGANIZATIONS INTERESTED IN CONSERVATION

American Association For Conservation Information
400 Royal Street
New Orleans, La. 70130

American Camping Association, Inc.
Bradford Woods
Martinsville, Ind. 46151

American Committee for International Wildlife Protection
New York Zoological Park
Bronx, New York 10460

American Conservation Association, Inc.
30 Rockefeller Plaza
New York, New York 10020

American Forest Institute
1835 K Street, N.W.
Washington, D. C. 20006

American Forestry Association
919 17th Street, N.W.
Washington, D. C. 20006

American Geographical Society
Broadway at 156th Street
New York, New York 10032

American Water Resources Association
P.O. Box 434
Urbana, Ill. 61801

Denfenders of Wildlife
1346 Connecticut Avenue, N.W.
Washington, D. C. 20036

Ecological Society of America
Michigan State University
East Lansing, Michigan 48823

Ecology Action
P.O. Box 9334
Berkeley, Ca. 94709

Enviornmental Action
2000 P Street
Room 200
Washington, D. C. 20036

Other Organizations Interested in Conservation (Continued)

Environmental Research Institute
Box 156
Moose, Wyoming 83012

Friends of Nature
Petersham, Mass. 01366

National Association of Soil and Water
Conservation Districts
1025 Vermont Avenue, N.W.
Washington, D. C. 20005

National Audubon Society
1130 5th Avenue
New York, New York 10028

Resources for the Future
1755 Massachusetts Avenue, N.W.
Washington, D. C.

BOOKS AND PAMPHLETS

Overview of Ecological Problems

Borgstrum, The Hungry Planet, Collier-Macmillan. $2.95
Carson, Silent Spring, Crest, 1962. 95¢
Commoner, Science and Survival, Viking, 1967. $1.35.
Curtis and Hogan, Perils of the Peaceful Atom, Ballantine, 1970. $1.25
Dasmann, The Destruction of California, Collier, 1970. $1.50.
Ehrlich, The Population Bomb, Ballantine, 1968. 95¢
Leinward, Air and Water Pollution, Washington Square Press, 1969. 75¢
Longgood, Poisons in Your Food, Pyramid, 1960. 95¢
Marine, America the Raped, Simon and Schuster, 1969. $5.95.
Marx, The Frail Ocean, Ballantine/Sierra Club, 1967. 95¢
Paddock, Famine 1975, Little Brown and Co., $2.35.
Rienow and Train, Moment in the Sun, Ballantine/Sierra Club, 1967. 95¢
Rudd, Pesticides and the Living Landscape, University of Wisconsin Press. $1.95
Schurcliff, SST and Sonic Boom Handbook, Ballantine, 1970. 95¢
Earth Day - The Beginning, Arno Press/New York Times, 1970. $1.25
The Environmental Handbook, Ballantine, 1970. 95¢ (prepared for the April, 1970 Teach-In)

Texts and Anthologies

Billings, Plants and the Ecosystem, Wadsworth. $2.95.
Buchsbaum, Basic Ecology, Boxwood Press. $2.35.
Carvajal & Munzer, Conservation Education - A Selected Bibliography, Interstate Printers, Danville, Ill. $2.50.
Cox, Conservation Ecology, Appliton Century Crofts. $4.95.
Elton, Ecology of Animals, Barnes and Noble. $1.65.
Kormandy, Concepts of Ecology, Prentice-Hall. $2.95.
Odum, Ecology, Holt, Rinehart. $3.25.
Storer, The Web of Life, Signet. 95¢.

The Human Animal

Ardrey, The Territorial Imperative, Belta-Dell, 1966. $2.95
Dubos, So Human an Animal, Doubleday, 1969. $2.25.
Galbraith, The Affluent Society, Mentor. 95¢
Michael, The Unprepared Society, Vintage, 1969. $4.95.
Morris, The Naked Ape, Dell. 95¢.
Synder, Earth Household, New Directions. $1.95.
Whole Earth Catalog, Potola Institute. $4.00.

Pamphlets

Conserving Our Waters, Committee on Public Affairs, American Petroleum Institute, 1271 Avenue of the America, New York, New York 10020

Our Polluted World, American Education Publications, Education Center, Columbus, Ohio 43216

SUPPLY LIST

In making a list of needed supplies it is wise to determine the total amount of money available and whether any of the material could be used from the school facility chosen as the site for the course. Access to both laboratory equipment and shop facilities would certainly change the requirements for separate supply items.

The list is not to be considered complete but a starter for a district just beginning such a program. The detailed program will dictate the specifics needed and the staff will have to make decisions accordingly.

SUPPLY LIST

PAPER

5 reams white drawing paper 12" x 18"

1 case duplicating paper sub 20 wt.

1 box ditto masters

500 business size envelopes

1 roll butcher paper

2 reams assorted construction paper 12" x 18"

2 reams assorted construction paper 9" x 12"

2 reams tagboard 12" x 18"

1 ream tagboard 24" x 36"

1 ream white lined binder paper

5 rolls of waxed paper

MISCELLANEOUS

10 boxes magic marker flow pens, assorted colors

2 gross pencils #2

15 lbs. plaster of paris

1 gallon white glue

1/2 gallon rubber cement

12 rolls masking tape (6 3/4" wide, 6 1/2" wide)

12 rolls scotch tape

5 each of liquid tempera, plastic bottles, each color wanted

150 screw cap test tubes

1 incubator, constant temperature

150 petri dishes

1 lb. agar medium

SUPPLY LIST (Continued)

1 centrifuge

25 hand lens,w/lanyard

100 pairs of scissors

7 topographical maps of local area

10 rolls of 35 mm Kodacolor film, 20 exposure

10 rolls 35 mm Black & White film, 20 exposure

10 super 8 cartidge Kodachrome 2 film

12 yardsticks

50 12" rulers

7 boxes of chalk

2 boxes of colored chalk

4 bags of glass wool for water filtration

4 cartons of activated charcoal

1 corer for age determination of trees

1 soil test kit (Sudbury)

1 water test kit

10# lab detergent

If there is no access to a stop facility then allow for:

scrapwood and lumber supplies

nails (assorted sizes)

screws (wood)

4 hammers

4 screwdrivers (sto)

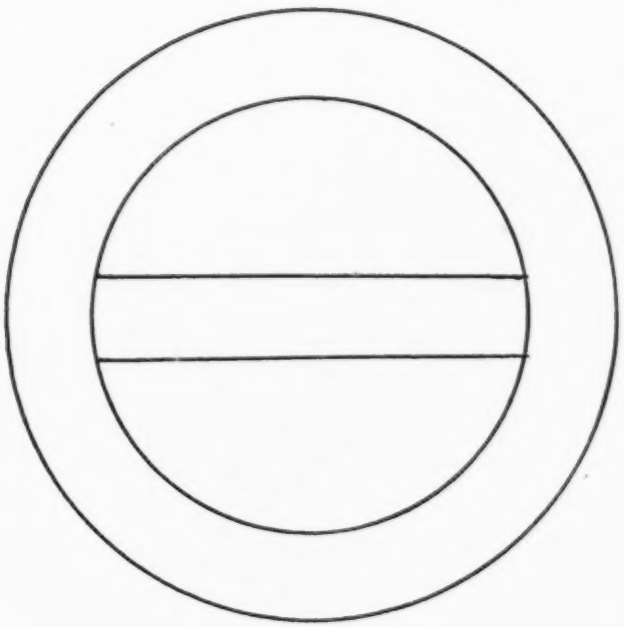
2 saws (crosscut)

nuts and bolts (assorted sizes)

2 pliers (linesman)

4 pliers (long nosed)

4 pliers (pipe)



CONSUMER HANDBOOK

1970

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INTRODUCTION

This booklet was compiled by a group of students in the Conservation Education course held at San Marin High School. It represents an important aspect of the course in that it is a project: Something Being Done.

We hope this booklet will increase your awareness of the ecological crisis we're all involved in. We especially hope that this booklet will help you to become part of the solution to our environmental problems.

Consumers have immense power. We hope you share our view that utilizing this power towards stopping pollution is to the benefit of everyone.

THE PROBLEM

It has just been stated that you are involved in an ecological crisis. The most important aspect of your involvement is your role as a consumer. Why do consumers have such an important role? Each day, we Americans produce nearly 800 MILLION POUNDS of trash. As a Californian, your individual average is 20.0 pounds of solid waste everyday.

About 40% of all this trash is packaging waste. Packaging waste is increasing six times faster than the population. Solid waste in general is increasing four times faster. Much of our solid waste, such as glass, plastic, and aluminum, cannot break down or decompose.

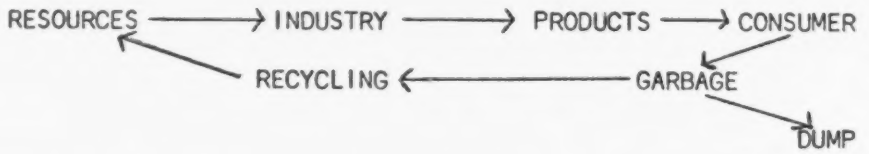
The point is: this cannot continue forever. We are running out of room and resources now. Many of the items we buy for convenience are having the opposite effect upon us.

The solution to this environmental crisis begins with each one of us as an individual consumer. Each one of us can do small things in our everyday life to lessen the harm we do to the earth that supports us. The importance of you acting as an individual cannot be overstressed.

In the following pages we have attempted to supply you with everyday earth-saving practices for your personal utilization. Remember, you as a consumer have the potential to save the earth from being enveloped by garbage!

RECYCLING

At present, the best method of curbing solid waste accumulation and conserving resources is recycling. Recycling is a process of reusing materials that were formerly used once and discarded.



To make real progress everyone should contribute his effort towards recycling the following materials: newspapers, glass bottles and jars, and aluminum cans and tin cans.

Newspaper

One ton of recycled newspaper can save 17 trees. The San Francisco newspaper drive started collecting 12 tons a day and progressed to 30 tons a day. We urge you to start and support local drives of your own. Please remember newspapers must be bundled and tied. Magazines (glossy paper) and phone books are not acceptable for recycling.

At San Marin High School, in the field to the west of the Administration Building, there is a bundled newspaper drop. For further information call 897-4274.

In San Francisco, the Independent Paper Stock Company, (650 7th Street, 621-6100) will take your paper for the price of about eight dollars per ton when delivered in tied bundles.

Glass

Every year we produce 135 bottles and jars for every person in the United States. Most of this fantastic amount of glass is used once (no deposit, no return) and then tossed out on the dump. To help stem this waste, you should request and buy soft drinks and milk in returnable containers. These containers can be used twenty times over and then recycled into new containers.

Secondly, you should save all otherwise one-way bottles and jars for recycling. San Marin High School will have a large box in the field near the paper bin to receive your glass. It can only be accepted, however, if it is clean and free from all labels and metal rings. Please be certain that only clean, label-free glassware is placed in the collection bins.

In Oakland, Owens-Illinois, Inc., (1964 Mountain Blvd., 339-8686) will pay one cent per pound for no-deposit, no-return bottles and jars. Please clean and remove labels.

Organic Matter

By saving kitchen food scraps from being washed out into the water system, you can help America clean up her water problems. The easiest method of bypassing the sewage system and bringing wastes to a useful end is by making a compost pile.

Start by constructing a small bin (4' by 6', 6' by 6' or whatever's convenient) and adding daily food scraps; coffee grounds, leaves, garden trimmings and horse manure (a good nitrogen source.) Then add a layer of limestone and bone meal. Cover this with a layer of soil or black plastic sheet to keep in heat and protect the pile from animals and breeding flies. There are many other methods of composting. For instance, it can be done without bonemeal and limestone. For more information and other techniques of composting check into books on organic gardening. Suggestion: If you are interested in organic gardening urge the local sanitation district and city council to consider community composting. This would make organic fertilizers available to community members.

Cloth

Give reusable clothing to charity organizations which operate second hand or thrift shops. The Salvation Army and Volunteers of America, as well as Goodwill Agencies will take all old clothing. A good deal of agricultural land is used by the clothing industries. Reusing clothing helps to conserve this land.

Aluminum

Aluminum is a valuable mineral that has been given a one-way ticket to the municipal dump. Someday soon the best aluminum mines may be that very same place. At the rate we use aluminum (cans, foil, T.V. dinners, pie trays, etc.) it is no wonder that, if not reused, the resources for this metal will dwindle. Another important point is that aluminum is relatively corrosion free. It won't break down for a long period of time, a time that is about four times that of tin.

Aluminum cans can be recognized by their seamless, molded bottoms. There is no side-seam and they are very light weight.

San Marin High School has a large collection bin for aluminum at the school and has smaller boxes placed around town for your aluminum. Please clean and flatten the cans before depositing in the bins.

The Golden Gate Distributing Company (1942 Fourth Street, San Rafael) will pay 10¢ a pound for cleaned and crushed aluminum in ten pound quantities. They are open for collection between 10 A.M. and 2 P.M. on Mondays and Thursdays.

Tin

There are 250 metal cans produced in the United States per person annually. The tin lined steel drink can, which accounts for a great deal of solid waste and unsightly litter, can be recycled.

Once again San Marin High School has deposit bins for tin cans available. Please clean the cans and remove the labels. Drink cans and food cans should have the ends removed and the tubular section crushed.

In South San Francisco, the A & T Chemical Company (761-0141) will accept cleaned and flattened cans. They will pay $22.00 a ton with a minimum of one ton required.

Plastics

We are unable to recycle plastic at the present time. Unfortunately, this is a special problem because plastic does not break down. Since it is a widely used medium for containers it should either be reused or avoided. This may not be as convenient, but the earth has to pay for our conveniences. As a consumer you can write to the companies using plastic containers and ask them to use glass or aluminum. Also encourage them to develop a fast decomposing plastic for food containers.

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AUTOMOBILES

Aside from being a great asset to the field of individual transportation, the family automobile is a menacing health hazard. The automobile alone, among all air polluters, contributes 50 to 75% of all the air irritants we suffer from. It is also responsible for an annual toll of 50,000 deaths.

In light of this we recommend:

1. The use of carpools;
2. The use of public transportation whenever possible;
3. Walking and bicycling (they are great exercise);
4. Keeping a check on smog control devices by having them cleaned and replaced regularly;
5. Keeping your car clean and well-tuned, for 35% of smog is from badly tuned engines and bad spark plugs; and

6. Converting your car to propane, or LPG. This will reduce pollution by 70% and nearly double your engine life. For further information on converting your car contact Stokes Appliance Service on Sir Francis Drake Blvd. in San Geronimo Valley.

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DETERGENTS

Perhaps the major home pollutants of water are the detergents. All detergents are now biodegradable but they still contain phosphates. The phosphates you release into the sewage system from your washing machine and dishwasher act as fertilizers when they reach rivers or the bay and they stimulate massive growths of algae. During an algae bloom, the water becomes green and eventually the rotting, foul smelling plant matter washes up on the beaches. The large quantities of algae use up a great deal of the available oxygen thus depriving fish and other aquatic animals of the oxygen they need to live. Eventually the dead plant and animal material accumulates on the bottom and hastens the aging of the body of water. The bad experiences of Lake Erie and Clear Lake clearly show what damage can be done.

The elimination of this phosphate pollution through individual action would be a very important contribution in the fight to save the environment. There are several things that you can do to help solve the problem.

1. Boycott the high phosphate detergents. Switch to a low phosphate detergent (see list below) or change to a soap/soda washing combination (see next page). Below is a list of recommended cleaning agents compiled by the Marin Conservation League.

RECOMMENDED CLEANING AGENTS

Laundry Soaps - negligible phosphates
- Lux
- Ivory Snow
- White King Soap
- Instant Fels

Liquid Dish Detergents - all low phosphate

Misc. Recommendations
- Ajax All-Purpose
- Arm and Hammer Sal Soda
- Lestoil
- Mr. Clean
- Pinesol

Detergents - low phosphate

Liquids
- Amway LOC - Amway Distributors
- Basic H - Shaklee Distributors
- Bestline Liquid - Bestline Distributors
- Koolwash - Nutrilite Distrib.
- Liquid Cold Water All
- Wisk

Powders
- Basic L - Shaklee Distributors
- Trend

NOT RECOMMENDED

Automatic Dishwasher Compounds - high phosphates - USE SPARINGLY
Enzyme pre-soaks - high phosphates - AVOID
Borax compounds - AVOID

EASY STEPS FOR A DETERGENT-FREE LAUNDRY:

a. Run clothes through a regular wash cycle with nothing added to the water but 1/2 cup (phosphate-free) washing soda. Repeat the process until there are no suds. Otherwise, the residue of detergent from repeated launderings can react with the heavy-duty soap and the washing soda to cause yellowing.

b. For the actual laundering (with soap) follow these steps: Put clothes in washer. Then add water. Next add 1/4 to 1/3 cup of washing soda. When soda is completely dissolved, add soap product. If you stick to this clothes-water-soda-soap sequence, the soap is less likely to react with the minerals in hard water and form curds. Use about 1 1/2 cups soap product for front-loading machines and 1 2/3 cups for top-loading machines. You may need to adjust the amount of soda and soap slightly because of variations in water hardness. The height of the suds is a good point of reference. Try to maintain a two-inch "head" or suds throughtout the wash cycle.

The "Easy Steps" process above has been recommended by the Marin Conservation League.

2.. The second thing you as an individual can do is to write to the detergent manufacturers urging them to develop phosphate free products. However, emphasize that the phosphate substitute must be a non-pollutant.

LEADING DETERGENT MANUFACTURERS:

Proctor & Gamble
President: J. H. Morgens
301 East 6th Street
Cincinnati, Ohio 45202

Colgate Palmolive
300 Park Avenue
New York, New York 10022

Lever Brothers
New York, New York

Bestline Products, Inc.
President: W. E. Bailey
P.O. Box 6416
San Jose, California 95150

Amway Corporation
Ada, Michigan

3. The third thing you can do is write to your Congressmen demanding a ban on detergents containing phosphates and a requirement that all cleaning agents list the ingredients on the package. There are two such bills under consideration at present authorized by Rep. Roman C. Pucinski (D-Ill.) and Senator Gaylord Nelson (D-Wis.). You can show your

support by writing to these men. The names of the men who represent you locally can be found in a later section of this booklet.

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SAFE GARDENING

Chemical fertilizers and pesticides pose a great threat to our organic and inorganic environment. When these poisons enter the food chain at any one given point, they pass their original malice on and on and on through the various levels of the food chain.

On a large scale, the greatest pollution from pesticides and fertilizers is done in agriculture. Beyond the initial effect of the pesticides in killing good as well as bad insects, birds and other small wildlife, there is the danger that comes as a result of the poisons remaining in the soil, plants and animals. The residue in the soil from both pesticides and fertilizers is washed with rain and dissolves into watersheds. This kills some organisms which depend on the water (especially fish; in 1961 agricultural poisons accounted for 5,600,000 fish kills) or the poisons become part of and change the balance in the life there.

As one organism (this organism could be man) feeds on another organism, dead or alive, which has been exposed to these chemicals, the consuming organism takes in the poisons from the food (organism eaten) and stores it in his body. A good example of this is what happens when a lake is sprayed for insects. The fish eat the poisoned insects and then man eats the fish thus passing the poison along. Man, with his very wide range of consumption, is killing his pests and himself with the same breath.

In and around your own home you can help curb the increasing chemical pollution of our earth. Make yourself a compost or mulch pile and use only organic fertilizers. Six to eight inches of mulch around plants eliminates weeds while it enriches and helps the soil retain water. Put coffee grounds in your flowerbeds. Sludge and manure should be used for growth stimulation. Soil with a high organic content and nutrient balance helps plants resist insects and diseases. Do not be scared off by a worm in your apple!

What do you do about insects in the home? First, uncover their hiding places and do not let them get a good foothold. Then treat them with safe pesticides (a helpful list of pesticides will follow). For outdoors, use predator insects and insect-killing parasites. Use safe pesticides only when necessary and consult your local nursery for specific directions. BEFORE using any product, check the labels for cautions, <u>read all instructions thoroughly</u> and follow them precisely.

SAFETY RATINGS FOR INSECTICIDE PLANT SPRAYS

The list below was compiled by Louis Pyenson, New York State entomologist and plant pathologist. It is included in the "Handbook on Garden Pests" published by the Brooklyn Botanic Garden and was taken from the California Living magazine in the Sunday paper. Mr. Pyenson gave the following safety ratings for insecticide plant sprays, listed by their generic names.

A - Relatively nontoxic

Bacillus thuringensis, sold as Bio-guard Thuricide
Lime-sulfur sprays
Milky disease spore dust
Petroleum oils
Pyrethrins, used in most household sprays, toxic to fish
Rotenone, toxic to fish

B - Relatively low in toxicity and hazards; use precautions in handling

Carbaryl, sold as Sevin, has cumulative effect
Malathon, has cumulative effect
Methoxychlor, accumulates in the body

C - Moderate in toxicity and hazards, warning statements on label

Chlordane, accumulates in the body, residues in the soil 10 years or more
DDT, accumulates in the body

D - Highly toxic and hazardous; warning statements on the label. Avoid all skin contacts and applications to edible plant parts.

Diazinon, sold as Spectracide, cumulative effect
Endosulfan, sold as Thiodan, cumulative effect

E.- Extremely toxic and hazardous; skull and crossbones on label. Not listed or recommended for home gardeners.

A SPECIAL NOTE: Dichlorvos, an insecticide, is used by Shell in their No-Pest Strips. The Food and Drug Administration has stated that these strips SHOULD NOT BE PLACED NEAR OR AROUND FOOD. This handy deathtrap for flies and other insects is actually nerve gas, in a reduced form. For further information concerning the No-Pest Strip, please consult the July 1970 issue of Earth Times.

In case any of you should wish to nourish yourself and/or others with foods that have not been sprayed with chemicals, here are addresses of stores that sell such products:

Evelyn Porter's 897-2277
1659 S. Novato Blvd., Novato

Embury's San Rafael Health Foods 457-0132
1732 4th Street, San Rafael

Rock Island Line Organic Food Trip 332-2195
1915 A. Bridgeway, Sausalito

Golden Valley Market 388-9129
64 E. Blithedale, Mill Valley

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WHERE TO WRITE

Participate in our democracy by making your views known.

Congress

Senators	Alan Cranston, Room 4241, New Senate Bldg. Washington, D. C. 20510	
	George Murphy, Room 452, Senate Office Washington, D. C. 20510	
Representatives	Don Clausen, Room 1034 House Office Bldg. Washington, D. C. 20515	
	Wm. Mailliard, 2336 Rayburn House Office Washington, D. C. 20515	
State Senate	John F. McCarthy, State Capitol Sacramento, California 95814	
State Assembly	Wm. T. Bagley, Room 4017, State Capitol Sacramento, California 95814	
County Supervisors	John F. McInnis	Michael Wornum
	Peter Arrigoni, Jr.	Louis Barr
	Arnold Baptiste	

All of the supervisors may be reached by addressing letters to the individuals or to John F. McInnis as Chairman of the Board
Board of Supervisors
Civic Center
San Rafael, Ca. 94903

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ORGANIZATIONS

Following is a list of informative and joinable organizations. All are interested in improving the quality of the environment.

Sierra Club, 1050 Mills Tower, San Francisco, Ca. 94104

Friends of the Earth, 451 Pacific Ave., San Francisco, Ca. 94133

National Audubon Society, 1130 Fifth Ave., New York, New York 10038

Zero Population Growth, Roy Schubert, P. O. Box 471, Kentfield 94904

Planned Parenthood, 710 C Street, San Rafael, Ca. 94910

Marin Conservation League, 1368 Lincoln Ave., San Rafael, Cal. 94901

Marin Ecology Center, 19 Cypress, Kentfield, Ca. (457-1742)

Ecology Action Educational Institute, Box 9334, Berkeley, Ca. 94709

Bay Area Air Pollution Control District, phone 415-771-6000

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AVAILABLE LITERATURE

If you are interested in gaining further insight into environmental problems and possible solutions we recommend the following literature.

Books

- The Population Bomb
- Poisons in the Air
- Agenda for Tomorrow
- Ecotactics
- Environmental Handbook
- Defoliation - What Are Herbicides Doing to Us?

Magazines and Periodicals

- National Wildlife
- Survival
- Earth Times
- Sunset
- Conservation News
- Environment

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SOURCES

1. Various handouts printed by Ecology Action of Berkeley; authors were Tom Regan and Ted Radke
2. Marin Household Survival Manual, by Marin Ecology Center
3. Marin Conservation League

COMPILED BY THE CONSUMER PRESSURE COMMITTEE

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Matt Lagle
Peggie McKeown
Shannon Lane

A special thanks to the staff and the students of the Conservation Education Course for their help and contributions.

STATE REPORT

TO BE FILED BY DISTRICTS

In order to help us in determining if this booklet has met its objectives, please fill out and return this questionnaire to the California State Department of Education:

1. DID YOU ESTABLISH A SUMMER SCHOOL CONSERVATION PROJECT?

   YES_____ NO_____

2. WAS THE PROGRAM MULTI-GRADED?

   YES_____ NO_____

3. WAS THE GUIDE USEFUL?

   YES_____ NO_____

4. DO YOU HAVE ANY SUGGESTIONS FOR IMPROVING THE GUIDE?

   _____

   _____

   _____

5. ARE YOU PLANNING TO ESTABLISH A SUMMER SCHOOL CONSERVATION PROJECT?

   YES_____ NO_____

6. DO YOU FEEL THE GUIDE WILL BE HELPFUL IN ORGANIZING THE PROGRAM?

   YES_____ NO_____

Name of School District_____

Address_____